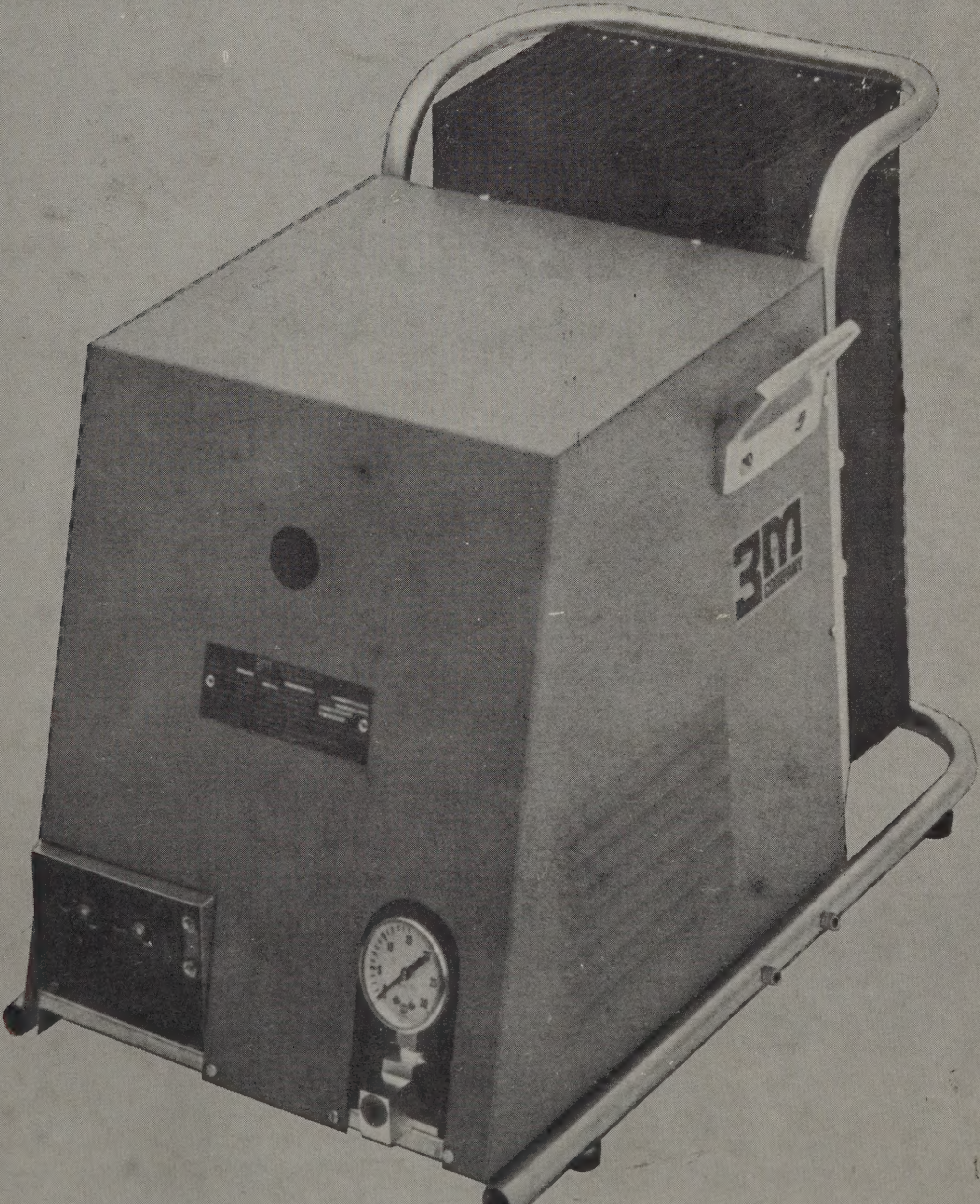
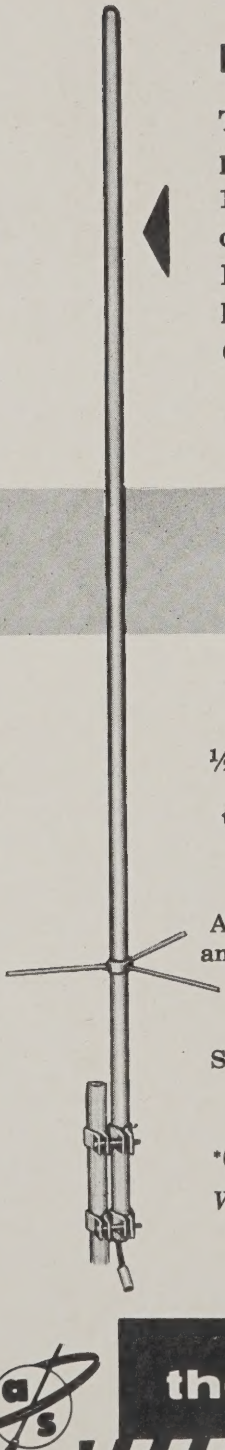
SEPTEMBER, 1962
Volume 2, Number 9

Communication HORIZONS



THE FINEST BRAND FOR EVERY BAND

BASE STATION 6 db GAIN



MODEL ASP-298

This Colinear Vertical 6 db gain* antenna provides omnidirectional coverage in the 130 - 174 mc range. Gives 4 times the radiated power of your transmitter and is twice as sensitive in receiving. Heavy duty construction throughout with adequate lightning protection. Write for complete listings in Catalog SD-152. (Base Station Antennas)

*(Reference: Ground Plane Antenna)

MOBILE ROOF TOP ANTENNAS

MODEL ASPR177

½ wave length, high gain, roof top antenna. 130 - 174 MC. 3db gain* doubles transmitting power. Sealed, tamper-proof transformer. 100 watt continuous load.

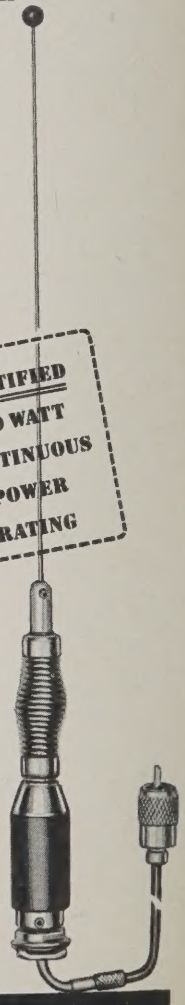
MODEL ASPR203 Kit to adapt ASPR177 to fit GE and RCA mounting base and convert these models to ½ wave length. 100 watt continuous load.

MODEL ASPR206 Conversion Kit. Same as ASPR203 except converts Motorola TU316 or P-9363 antenna to ½ wave length high gain, 100 watts.

*(Reference: ¼ Wave Length Antenna)

Write for Complete Listings of Communication Antennas in Catalog SD-144.

CERTIFIED
100 WATT
CONTINUOUS
POWER
RATING



the antenna specialists co.

12435 EUCLID AVENUE • CLEVELAND 6, OHIO

Stripes of Quality
(Trade Mark)

AND WHAT'S HAPPENING WITH YOU THESE DAYS?

For months now, we here at COMMUNICATION HORIZONS have been telling you what we are up to. Now, we'd like to know what's going on in **your** shop. What are your current problems? What tricky jobs have you accomplished lately? **What's new?**

We ask this for two reasons. One, if you tell us what **you** are doing then we will be able to better serve you by bringing you the information you need. And two, **your** activities, problems, and accomplishments may be news in themselves, helping other people in the industry.

To make it easy for you, we've prepared the card below. Just fill in any of the blanks which may be appropriate, drop it in an envelope, and airmail it to Communication Horizons, P. O. Box 1557, Oklahoma City 1, Oklahoma. Today is the day to do it!

Communication report for the period ______________ to ______________.

New personnel in period: ______________

New test equipment installed: ______________

New antennas installed: ______________

New mobile units installed: ______________

New base stations installed: ______________

New repeaters installed: ______________

New systems installed: ______________

Current problems: ______________

Plans for next 30 days: ______________

From: Firm: ______________

Location: ______________

Signed: ______________

Date: ______________

PLACE
STAMP
HERE

HORIZONS PUBLICATIONS INC.
P. O. BOX 1557
Oklahoma City 1, Okla.

ATTN: PROMOTION DEPARTMENT

YES - ENTER MY SUBSCRIPTION TODAY

for________16 issues of Communications Horizons at the special price of $4.00. **I am mailing this form before September 1, 1962.**

________15 issues of Communication Horizons at the special price of $4.00. **I am mailing this form before September 8, 1962.**

________14 issues of Communication Horizons at the special price of $4.00. **I am mailing this form before September 15, 1962.**

________13 issues of Communication Horizons at the special price of $4.00. **I am mailing this form before September 20, 1962.**

________12 issues of Communication Horizons, $4.00. **I am mailing this form after September 20, 1962.**

Name ________________________________

Radio Call Sign ________________________________

Address ________________________________

City/Town________________ **Zone**____ **State**____________

Airmail today to:

COMMUNICATION HORIZONS
P. O. Box 1557
Oklahoma City, Oklahoma

Yes, I'm interested in finding out more about your other magazines. Please send me a sample copy and ( ) subscription ( ) advertising data for

- **( ) CB HORIZONS**
- **( ) tv horizons**
- **( ) VHF HORIZONS**

Name ________________________________

Address ________________________________

City________________ **Zone**____ **State**____________

SPLATTER

from JIM KYLE, K5JKX
CH Managing Editor

MOST OF US have trouble enough keeping up with the FCC Rules as they apply to our own individual interests—but occasionally a long look at the entire scope of the Commission's Big Book proves interesting. I'm excluding the Broadcast field, of course, because that's an almost completely separate world, but from time to time Commission actions in experimental, amateur, restricted-radiation devices, or even Citizens Radio services have implications for the communications industry.

Like for instance right now.

Those of us who are concerned mostly with Parts 9, 10, 11, 16, or 21 of the FCC Rules and Regulations already know of the terrific competition for spectrum space which has existed for lo these many years and can confidently be expected to continue for many years more.

But at least most of us have relatively clear channels on which to operate.

On the other hand, the people who operate under Part 19—the Citizens Radio Service—are at the moment faced with a spectrum squeeze like none of us has ever known. On a statistical basis, there's one CB licensee every 5.2 square miles across the nation—and all of them are limited to a 300-kc wide band. This means that attempts to communicate in this service are strongly reminescent of two dogs and three cats fighting over a fish!

"This is all very interesting," I can hear you saying, "but it has nothing to with me. I have troubles of my own!"

True, quite true. Except for one thing. While many of the Part 19 people are admittedly just private citizens who want two-way radio in their automobiles and homes, a surprisingly large number are small-business operators who are using this highly crowded, overly congested space to carry on regular dispatch-type operation!

They go into radio by the Part 19 route rather than under Parts 11, 16, or 21 for two reasons: First, Part 19 equipment is less expensive (average cost of equipment is about $150 to $200 per unit). Second, almost no justification of need for the license is required. Red tape is almost non-existent.

So there they are. They find out rather rapidly that radio is a great help to them in their business—but they also learn (the hard way) that the Citizens Radio Service has many disadvantages for business use.

A while back we were talking about Commission actions. That's where the Part 19 people are at the moment. All summer, high FCC officials have been promising big developments regarding Part 19. Anticipated release date is sometime in October. The hints have it that the development will be a *complete* revision of the Rules for this service to attempt to discourage the type of operation now used.

But like all major changes, this revision will undoubtedly take a little time to sink in. Present licensees will probably try to buck the change as long as they can. And in the meantime, the small businessman will be getting more and more disgusted.

And this is where the plight of the Part 19 operator begins to fall into the realm of you, gentle reader.

If you are in the business of manufacture, sale, or service of non-broadcast radio equipment under any of the other Parts of the FCC rules, you have waiting for you a golden opportunity.

Because in addition to the 5-watt wizards of Part 19, the Commission has another service—the Business Radio Service—which includes a number of channels very near to the Part 19 frequencies. So near, in fact, that much of the existing Part 19 gear (antenna, receivers, etc.) operates equally well on BRS channels.

As this is written, only a couple of manufacturers are building equipment for this service—and like all commercial non-broadcast services, equipment must be type-approved. But the opportunity is there, and a complete new market awaits the equipment maker, salesman, and service technician who will take it.

And it hardly needs to be added that every station licensed under *this* service is one less to worry about come channel-splitting time, for your *own* area of major interest!

What do you think? **—jk**

SEPTEMBER, 1962
Volume 2, Number 9

Communication HORIZONS

and "Two-Way Radio Digest" Published Monthly by
HORIZONS PUBLICATIONS, P.O. BOX 1557, Oklahoma City 1, Okla.

CONTENTS

Sy-Pep Paper **4** Using Radio for Remote Control
Service Profile **6** 960 Units — a Cinch
New Horizons **8** Fuel Cells — Right Now
Obituary **10** Conelrad Is Dead
Public Safety **12** A Long Look
Bob Tall Reports **16** Our Man in Washington

DEPARTMENTS

1 Splatter
14 Logbook
18 Classified Advertisements
19 CH Showcase
20 Milestones

Publisher Robert B. Cooper, W5KHT
Managing Editor Jim Kyle, K5JKX
Associate Editor Russ Miller
Washington Bureau Robert E. Tall
Service Editor I. Kay Redd, Jr.
Contributing Editors Robert E. Brooking
Jeremiah Courtney
Advertising Director Stanley M. Searle
Associate Art Director Jean Schaefer
Business Manager Patrick T. Pogue

OUR COVER:

Fuel cells have, so far, been a dream of the distant future to most of us. But this summer, a large adhesive manufacturer demonstrated an **in-production** unit. The cover photo shows the rear of one of these units; Washington bureau chief Bob Tall tells all about them starting on page 8.

ADVERTISING

Communication Horizons Magazine accepts commercial display advertising from bona fide manufacturers and distributors of communications equipment and associated apparatus. Advertising rate card and coverage data available upon request. Call collect area code 405 CEntral 2-1108 for advertising information.

CIRCULATION

Communication Horizons Magazine is read monthly by nearly 10,000 two-way communication engineers, technicians, installers and users. Detailed circulation breakdown available upon request.

COMMUNICATION HORIZONS (title registered U. S. Post Office) entered as second-class postage material May 20, 1961. Second-class postage paid, Oklahoma City, Oklahoma. All rights reserved. Subscription rates in the United States and Canada, $4.00 per year. Single copies not available. Subscriptions outside the U.S.A. and Canada, $5.00 per year.

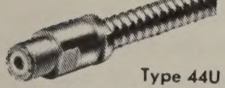
Only from Andrew

ALL COPPER Foam Coaxial Cable

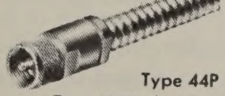
Here is the new copper Foam HELIAX "ready to install" cable kit that offers electrical superiority at no premium in price. Foam HELIAX is available in ½ and ⅞ inch diameters, cut to your specific length, with end fittings factory attached.

Unique corrugated design of the copper outer conductor permits Foam HELIAX to be pulled through conduit and around obstacles in applications where smooth wall cable could not be installed.

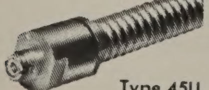
Cable Fittings for Foam Heliax



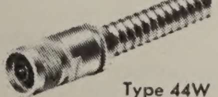
Type 44U
Type UHF jack for
½" Foam Heliax



Type 44P
Type UHF plug for
½" Foam Heliax



Type 45U
Type UHF jack for
⅞" Foam Heliax



Type 44W
Type N jack for
½" Foam Heliax

Complete specifications on Foam HELIAX available in Andrew Bulletin 8484. Write,

Andrew
CORPORATION
P. O. Box 807 • Chicago 42, Illinois, U.S.A.
Boston • New York • Washington, D.C. • Los Angeles
Toronto, Ontario, Canada

Antennas • Antenna Systems • Transmission Lines

Arthur W. Brothers, President
Systems Engineering Limited
(SEL), Burney, Calif.

Using Radio for

AS REPORTED in the July issue of CH, the FCC has granted a third license for remote control of a locomotive from a person working alongside the unit in switching operations.

This presents some interesting ideas in the application of remote control to radio use, and one in which practical application can reap for the firm to construct such equipment substantial profits. Consider the application of a portable type radio for control of a locomotive:

The usual method of locomotive control requires up to three men for operation—the engineer, fireman, and brakeman. Two of these men ride the cab; the third gives directions to the engineer when the distance to the work is such that the enginer cannot really see what is going on. Thus, the brakeman is really the most valuable person in locomotive switching operations. Through application of state-of-the-art design methods of RF control problems, the need for human, direct control can be transfered to the man on the ground who is indeed the one who does the actual controlling. He signals the engineer, who in turn operates the levers, which in turn cause the locomotive to back, go forward, stop, etc. These three men are well paid.

Thus we have a direct cost motive of from $8,000 to $45,000 per year for the improvement of certain locomotive switching operations (depending on number of men now in the cab, and total hours per day of operation).

Now, consider the applications of our proposed remote-control system. In locomotives, the uses include steel processing, and switching of all types of heavy loads—some for only ten to thirty feet, and often the movement is at a very slow rate. In other types of plants such as power, lumber, and even some rail operations, the required movement is such that one man can accomplish the entire hook-up job, observation for obstructions on all sides of the prime mover and its load—and even step up into the cab of the prime mover, or on the load itself and ride along for the short haul.

The direct applications of such a control system can be extended to cranes, ship loading, and industrial control applications of many varied types. Even certain highspeed printing operations could achieve through the use of RF control systems in which the control head could be carried around like many of our lighter weight hand-portable radios.

SEL acted as a consultant to one early application of this principle where a major U. S. corporation had need of voice communiations between brakeman and engineer. Direct hourly savings through the application of this system were better than $5 dollars per hour for each of three locomotives (in man-hour costs alone), not to mention certain other larger savings through improved efficiency established by direct voice contact between the brakeman and the locomotive engineer. This first system, although crude by desired design standards, did and is still giving excellent results. It incorporated fail-safe design (so that if the carrier failed during a critical operation, or the brakeman fell, etc., an automatic alarm sounded in the prime mover), re-chargable batteries; and a positioned mikes held in front of the brakeman's lips-by a clip attached to his safety hat, which allowed full use of both hands at all times.

For full application of the remote control concept, several considerations must be kept in mind. These are listed and where necessary comments are supplied to show thinking of the author as concerns direct industrial application.

1) For full system use, the control must be able to operate on the same frequency as several other control systems. This is because frequencies are limited and the obtaining of frequencies (up to

Remote Control

50 of them for a given non-interfering area) is a remote possibility.

2) The individual control should not cause effective interference between controls operated in the same area, or right along side.

3) The individual control should be capable of transmission of at least 10 control signals. This will allow effective remote control of all functions related to locomotive and crane operations, as well as a reserve for various special functions.

4) The transmitter, hand carried, should have re-chargable batteries. It should be as light as possible (hand-held would be ideal). It should be capable of either attachment to the user's belt, or being carried on a belt.

5) Obvious, but best mentioned here, is that the receiver will be custom and installed with various servo and accessory outputs to enable control of various functions in the prime mover. These functions will of course, be again controlled electrically or via hydraulic means.

Now, the interesting part. In order to achieve non-interference operation and in order to be able to send many commands (but yet be light and subject to dropping, etc.) our transmitter must be solid state. Tones are out, as no possible combination could be used to yield effective control.

The author believes the only effective method to achieve the control desired would be to use advanced digital techniques. This way, when control unit number 43 is transmitted to prime mover 43, control function number 4, ·the following would happen. (In this case, let's assume control 4 was the command to move ahead, dead slow.):

The brakeman (or controller) would determine all was ready, the way was clear and perhaps walk out in front of the prime mover. He would then press button 4 of his control head.

The transmitter would flash out a digitizd, very-high-speed "blob" of pulsed information, not unlike a computer talking to itself, which in this case is the exact analogy we are after. This "blob" of data would have first a code which would cause the receiver in the prime mover to unlock for just sufficient time to pass the command signel number "4", which in turn would cause the operation of controls to enable prime mover to "go ahead, dead slow".

As the "on" time of our transmitter is very small, and as the receiver would not operate to any commands except those preceeded by its own control "code", we have a system which can accommodate several units operating in the same area, on the same frequency, at the same time.

The probabilities of any two units being on the air at the same time, due to the speed of transmission, are very slight. Also, if interference is received, the receiver in the prime mover could be designed to not act at all. In this case the man on the ground would just repeat the control operation. You could have a horn toot if the control signal were confused, or for other such "machine" signaling, or feedback, to the operator on the ground.

I would expect the design problems on such a unit not to be formidable. In fact, we have discussed the theory of such systems with several design engineers who work in the computer field, and have received assurances such a system is completely possible.

However, for a commercial firm to bring out such equipment, I would expect them to ask and get a rather interesting price for complete packages. Keep in mind that for most applications, the complete ontrol functions of the prime mover would require re-design, and this would not come cheap.

However, with the tremendous cost savings which could result to both the industrial and military market, such units could bring as high as $5,000 to $10,000 for each unit.

Who will be first? ■

Service Profile

960 Units-a Cinch

An engrossing interest in radio 25 years ago has resulted in a successful career in two-way radio servicing for Larry Kahle, owner of Mobile Communication Service, a Motorola service station in Detroit.

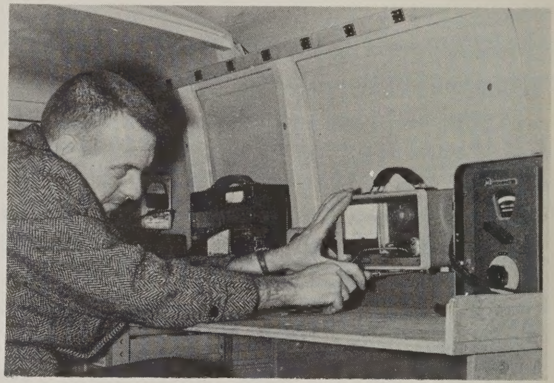
Now in its ninth year of operation, Kahle's company provides maintenance of approximately 800 mobile radios, 100 VHF radio paging units and 60 base stations used in the Motor City. Among the company's customers are th General Motors Technical Center, The Chrysler Corporation, Central Greyhound Bus Lines, Parke-Davis Laboratories, J. L. Hudson Department Store and the Ford Hospital. To handle this large volume, Kahle employs seven technicians including his brother William, besides himself.

Kahle became interested in radio as a hobby before World War II, but actually developed his radio electronics background during the war, serving as a technician for the Army Airwave Communication Service in the Pacific. After the war, he became a two-way radio maintenance chief for a cab company in Detroit.

In 1953, Kahle started Mobile Communication Services and immediately hired two technicians to handle his initial business. Since then the company has tripled the number of its employees and greatly expanded its service facilities.

Mobile Communication utilizes five service benches in its shop, each equipped with complete lines of test instruments and necessary servicing equipment. The company also operates two mobile vans, each having a bench and a complete array of tools, test meters and tube caddies for assignments at customer locations. "The vans are so completely stocked with equipment that we can handle any type of job from them, no matter how complex," said Kahle.

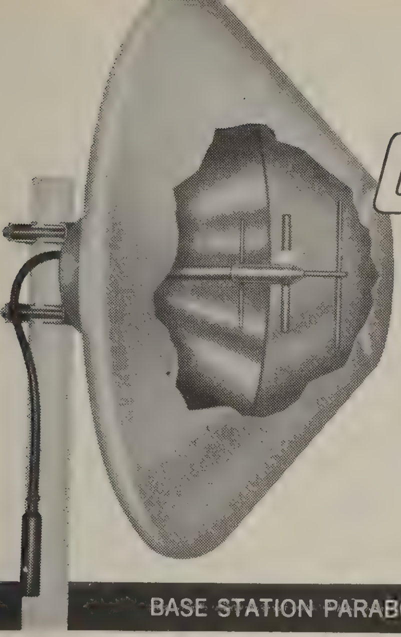
The vans, driven by technicians, and two automobiles, operated by Kahle and his brother, are equipped with two-way radios to enable the men to contact the office and each other. Used primarily to route technicians to job sites and to exchange vital information, the radio system also enables Kahle to keep in touch with activities while away from the shop.


Mobile Communications Services owner Larry Kahle installs an AC voltmeter above a work bench in a new repair van.

Even though the majority of his technicians, including three graduates of the Radio Electronics Television School in Detroit, have at least three years experience in two-way radio servicing, Kahle makes it a point to keep his men informed of the latest developments in the radio industry. He has them regularly attend Motorola service clinics where they learn theory and servicing techniques for new equipment.

Kahle also encourages his men to enroll in the Motorola Training Institute, a home study course designd for two-way radio technicians. According to Kahle, the course not only fits into his general training program for new men but also provides experienced men with helpful information on new transistorized equipment.

"Use of the information from the clinics and MTI by my men has not only increased the efficiency of our operations, but also has slashed 'outage' time for customers," Kahle said. ■



C·P COMMUNICATION ANTENNA SYSTEMS

—mean *CERTIFIED PERFORMANCE!*

BASE STATION PARABOLIC ANTENNA (18X-Unidirectional Gain)

CAT. Nos. 271-509 and 272-509
FREQUENCY RANGE 952-960 MC

Cat. No. 271-509 Parabolic Antenna consists of 3-element yagi antenna feeding a 27-inch diameter spun aluminum parabolic reflector. It may be mounted for horizontal or vertical polarization using the hardware furnished.

In regions where icing or severe winds are encountered, the antenna is available with a molded fiberglass wind screen and radome. The antenna complete with radome is designated Cat. No. 272-509.

SPECIFICATIONS

Electrical:

Nominal input impedance	50 ohms
VSWR	1.5:1
Bandwidth	±1.0%
Maximum power input	100 watts
Flexible terminal extension	18 in. of RG-8A/U
Termination	Type N male with Neoprene housing
Lightning protection	Direct ground
Vertical beam width (½ power points)	30°
Horizontal beam width (½ power points)	26°
Unidirectional gain	12.6 db

Mechanical:

Radiation element material		6061-T6 aluminum
Reflector material		3003-0 aluminum
Radome material		Fiberglass
Reflector diameter		27 in.
Rated wind velocity	Cat. No. 271-509	100 MPH
	Cat. No. 272-509	125 MPH
Maximum lateral thrust at rated wind	Cat. No. 271-509	170 lbs.
	Cat. No. 272-509	170 lbs.
Weight	Cat. No. 271-509	10 lbs.
	Cat. No. 272-509	12 lbs.

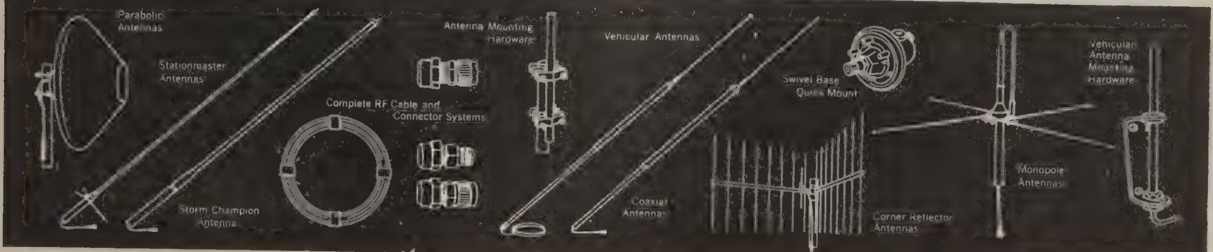
Galvanized steel hardware supplied to mount antenna on 2 in. IPS pipe.

SINCE 1933

COMMUNICATION ANTENNA SYSTEMS FOR AMERICAN BUSINESS

Communication Products Company
DIVISION OF
PHELPS DODGE ELECTRONIC PRODUCTS
CORPORATION
MARLBORO, NEW JERSEY—Telephone HOpkins 2-1880 (Area Code 201)
LOS ANGELES 65, CALIF.—Telephone CHapman 5-1143 (Area Code 213)

P D ELECTRONICS



Fuel Cells-Right Now

by Robert E. Tall
Chief, CH Washington Bureau

A giant step forward for the radio communications field, which is certain to have an effect on a great number of radio licensees whose systems include remotely located base or repeater transmitters, has been taken by the Minnesota Mining and Manufacturing Co. with its announcement of the first commercial marketing of a line of thermoelectric generators to power the remote installations.

Primary emphasis by the company at a showing of the new devices before commercial, government agency and military personnel in Washington was on four standard generators of 2, 4, 8 and 15 watt capacitiy, to which 30 and 60 watt devices are being added as off-the-shelf items.

Dr. Robert W. Fritts, manager of 3M's thermoelectric project, said the new thermoelectric generators "can compete favorably in cost and dependability with other conventional means for providing remote power in use today, such as primary batteries and gasoline driven motor generator units," and hold out even greater promise for the years ahead.

Thermoelectric generators with a 10-year service life, he said, are presently "more economical to operate than these other remote power devices in the range between a few tenths of a watt and approximately 300 watts," and the "balance can be tipped further toward the thermoelectric generator when it can be constructed in such a way as to provide more 'watts per dollar of capital cost'."

Initial costs, Dr. Fritts pointed out, can be reduced by simplifying generator construction and automating producing, "steps that will be taken as thermoelectric power generation grows in use."

As an example of radio communication application, the 3M scientist pointed out that a 15-watt generator can power a 100-watt radio base station, working in conjunction with batteries, which power the transmitter and then are charged by the thermoelectric device.

The standard generators, 3M's said, are designed to serve as rugged, low maintenance field generators capable of long term unattended operation. Available with liquid petroleum or natural gas burners, generators may be adapted to various voltage requirements by means of transistorized converters, provided as an accessory item.

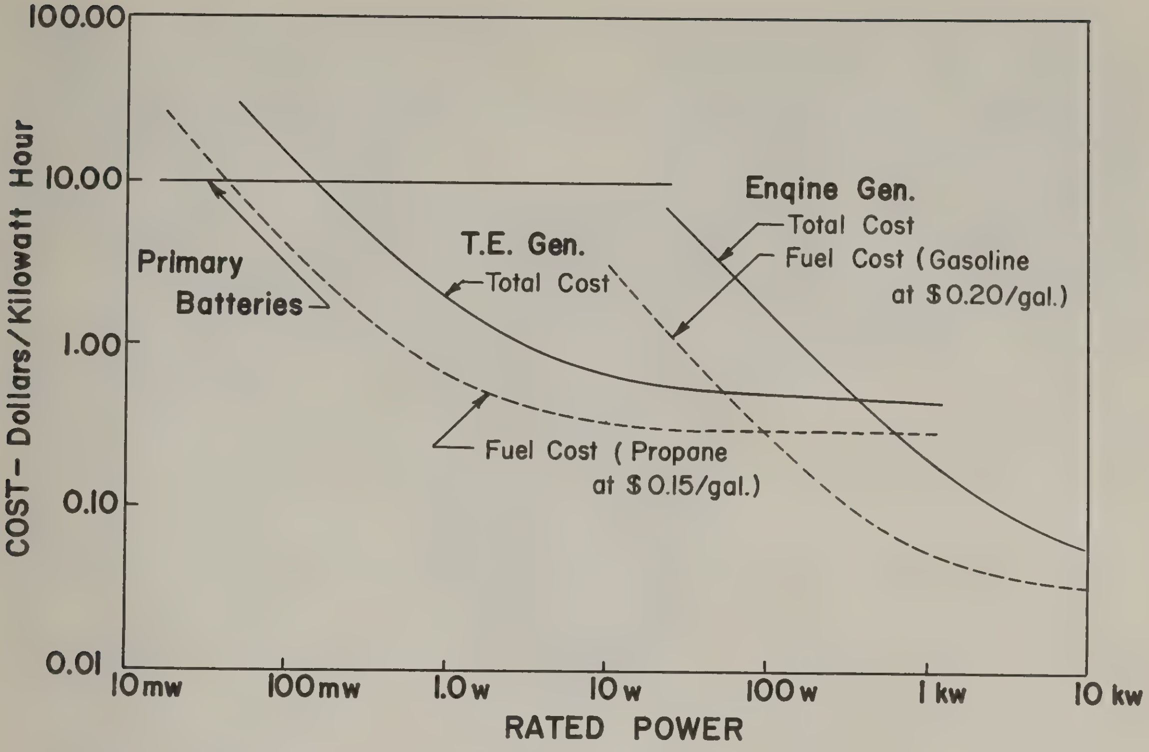
The generators themselves have no moving parts, the company said, and operate "virtually maintenance free over long periods of time." They may be used either as a means of recharging battery systems or as a direct source of electricity to replace battery systems. When used to replace battery power on an intermittent basis, they can be stored then quickly placed in service with no shelf-life problem.

Thermoelectric generators of the commercial line have been placed in operation for power for cathodic protection of underground gas mains, in which the generators are powered by gas tapped from the mains themselves; for power for radiotelephone equipment in fire towers and railroad cabooses; for power for radio repeater stations in remote locations; for power for battery charging applications; and for power for highway barricade flashers.

As an indication of the fuel requirements for operation of the generators, it was pointed out that a 15-watt generator can be operated continuously for one month on a 100-pound tank of propane. A standard 12-volt auto battery can be charged on 6 pounds of propane, approximately the amount contained in liquid form in a sphere the size of a volleyball.

Estimated operating cost comparisons between dry batteries and propane-fired thermoelectric generators used for power radiotelephones have been conducted by one government agency, purchaser of three devices. The operating costs for standard batteries used in portable sets average 11.2 cents per hour; for heavy-duty batteries used in stationary sets, 2.8 cents per hour, and for thermoelectric power, including the cost of amortizing a $550 investment over a 5-year period, .8 cent per hour. The agency's report said the cost included a transistorized converter, and propane cost was figured at 12 cents per pound.

The agency report concluded that "propane-powered thermoelectric generating systems have a practical application," in its radio systems, listing these advantages; lower operating costs than dry batteries; a uniform supply voltage; no significant



This graph compares the estimated cost in dollars per kilowatt-hour of three primary power sources — batteries, gasoline-powered engine generators and propane-fired thermoelectric generators.

voltage change with temperature; less taper in voltage with age; indefinite storage life for propane fuel; and fueling required less frequently than battery changes.

While the thermoelectric principle was discovered more than 100 years ago, it has only been within the past few years that the principle has been put on the track of providing power for radio and other equipment.

The United States three and a half years ago announced the development of a five-pound atomic powered device capable of generating electricity directly from an isotope heat source, and with it came the first practical demonstratioon of the direct conversion of reaction heat to electric current. The self-contained generator, named "SNAP III", for the Systems for Nuclear Auxiliary Power program conducted by the Atomic Energy Commission not only proved sound the principle of direct conversion, but it awakened new interest in the almost forgotten concept of thermoelectricity.

In the past three and a half years, relatively rapid advancements have been made toward developing practical uses for thermoelectricity.

The first known device produced capable of developing a thermal efficiency in excess of eight per cent was a 10-watt gas-fired generator delivered by 3M's to the US Coast Guard, which has been under test for more than a year, and has been approved for trial installation at sea, to power naviagtional aids.

The company delivered two-gas-fired generators to the Northern Illinois Gas Co. for use as a power source for cathodic protection of gas mains. A 10-watt generator delivered early in 1960 is now in actual field use, representing the first commercial application of a multi-watt thermoelectric generator. A 20-watt generator delivered in 1961 has been under laboratory test, preparatory to field installation.

The 3M "Aztec" generator, kerosene-fired, is the first thermoelectric generating device available for home use. A simple emergency power source, the generator was developed for powering transistor radios in fallout shelters, sportsmen's camps, vacation, farm and ranch, and other remote areas.

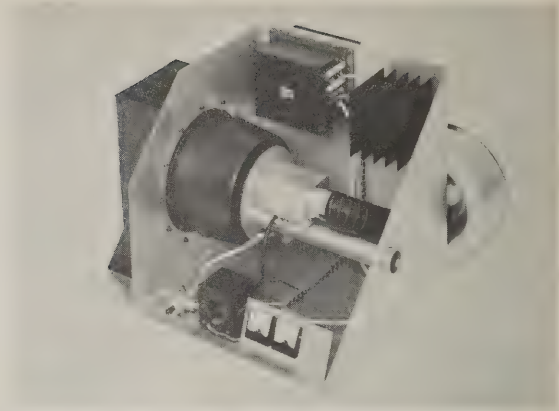
The company has also delivered a 250-watt gas-fired generator to the US Navy. This portable "Man-pack" generator, weighing only 37 pounds, achieves a net power-to-weight ratio for field use of more than 7 watts per pound, believed to be higher than any thermoelectric generator previously delivered by a contractor. Completed under a Navy research and development contract, the device is

A portable, lightweight kerosene-fired thermelectric generator designed for field use. This 30-watt, fan cooled unit weighs only 20 lbs., will also operate on high grade fuel oil, JP-4 or similar fuel.

designed to power surveillance radar, communications equipment and other Marine Corps field gear.

Minnesota Mining and Manufacturing said it feels that the major markets for commercial and military thermoelectric components, sub-assemblies and generators in the period immediately ahead will require gas and liquid fuel burning devices producing 1000 watts of power or less.

In the meantime, materials research is continuing in the constant effort to advance technical knowledge, operating efficiency and production capabilities of already proven thermoelectric semi-conductor materials.



This semi-automatic thermoelectric power system is designed to recharge storage batteries. Used in combination with three lead-acid batteries, in intermittent service, it will produce 200,000 watt-hours of power per year.

The company said it is seeking materials, designs and devices which will produce more "watts per dollar" — of customer investment, of operating cost seven times greater than an existing and example, a material which might produce an additional two per cent efficiency, but has an initial cost seven times greater than an existing and proven material does not represent a real advancement in terms of "watts per dollar" produced.

The "dollars per watt" cost of 3M-developed devices has been lowered by 100 times in three years. The cost of the initial "SNAP III" generators was approximately $3000 per watt. The cost of some types of 3M commercial generators available today is about $30 per watt, based on pilot plant production.

Conelrad Is Dead

CONELRAD is dead. The long-anticipated demise became official with an FCC order dated July 13 (see last month's CH, page 16) which ordered deletion of certain parts of Commission rules.

The rule sections deleted were those requiring compliance with CONELRAD procedures in Parts 5, 10, 11, 12, 16, 19, and 20 of FCC Rules and Regulations. Virtually all non-broadcast services were thus relieved of CONELRAD responsibility.

What does this mean to you as a non-broadcast licensee?

First of all, it means you no longer need have a CONELRAD monitor in operation at your control and dispatch points! While it's no secret that many if not most non-broadcast licensees have not been using monitors for some time, it was still (as pointed out on Page 8 of our May, 1962, issue) an official requirement and cases had been being prosecuted.

But no longer is the monitor necessary. You now have no need to worry about the inspector catching you short.

Second item of importance resulting from the rules change is that now you can continue to stay on the air in the case of national emergency.

In fact, you will be officially encouraged to participate in civil defense planning and to make your system available for CD operation should the need ever arise.

This possibility of large networks for emergency communication use was, we understand, one of the biggest factors involved in bringing about the change. The chances of uncontrolled transmissions aiding a possible enemy were weighed against the benefits of a nationwide communications system, and the result was the July 13 order.

“two-way radio communications?

simplify your maintenance problems”

No other single instrument approaches the MCM-5 MULTI-CHANNEL MONITOR for versatility, accuracy, reliability, and simplicity of operation. Skilled or unskilled personnel can easily make transmitter-receiver measurements to comply with new F.C.C. regulations. Check these features:

Accommodates 23 Channels at freqs. of 25-1000 Mc. (IF freqs. 280 Kc-13.5 Mc.)

Frequency Measurements:
± .00015%; Visual or aural readout.

Peak Deviation Measurements:
Two Ranges—0-6 Kc and 0-18 Kc.

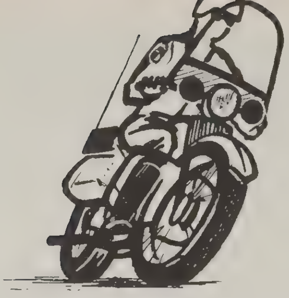
Signal Generation:
Frequency Accuracy ± .00015%. Output Level: 0-1, 0-10, 0-100 μ volts ± 2db.

Operation: Fast and simple to operate; portable; ideal for shop or field use.

For detailed information of the MCM-5 write Dept. A

Cushman Electronics, INC.

166 SAN LAZARO AVENUE, SUNNYVALE, CALIFORNIA
Area code 408 739-6760



PUBLIC SAFETY COMMUNICATIONS

by Robert E. Brooking, Communications Engineer — City of Burbank, California

The Twenty-eighth Annual APCO Conference held in Clearwater, Florida is now history. One of the important items on the program was a report given by Joseph M. Kittner, legal counsel for the Associated Public-Safety Commission Officers.

For those not familiar with the background of Mr. Kittner, he was one of the most able and respected lawyers on the staff of the Federal Communications Commission. In 1955 he was appointed Assistant Chief of the Safety and Special Radio Services Bureau, serving under Mr. Curtis B. Plummer. Mr. Plummer had previous service as a Chief Engineer to the Commission and as his assistant Mr. Kittner had an excellent opportunity to become thoroughly familiar with the problems faced by the various Land Mobile Radio Services.

In his report, Mr. Kittner pointed out that, in his opinion, the time had arrived when it was necessary for the users of the various Public Safety Radio Services to undertake a thorough and comprehensive study of their present needs and, even more important, their future needs in the matter of radio spectrum space for the next ten years.

He went on to explain that there are many things which must be considered in such a study: the present overloaded channels in the large metropolitan areas; the continued population explosion from our large cities resulting in numerous suburbs of substantial size, each requiring radio frequencies of its own; the need for expanded means of intercommunication to provide faster exchange information, particularly in law enforcement; the rate of increase of crime; and finally the frequency needs which will result from new users such as two way radio for foot patrolemen, control of traffic signals and other things now being developed.

He pointed out that the Federal Communications Commission, by virtue of its position as a regulatory agency of the U. S. Government, has a statutory mandate to inquire into the needs of the Public Safety Radio Services. He said that APCO should ask, in fact petition, the Commission to hold such a statutory inquiry and determine the needs of the Public Safety Radio Services for the future, particularly in the light of the part which Police and Public Safety Radio play in our internal security.

There certainly is no room for argument with what Mr. Kittner proposes. If we, in the Public Safety Radio Services, do not undertake such a comprehensive survey of our own needs in the matter of radio spectrum space, then we shall find it necessary to operate in whatever space we are allotted and the results may indeed be unfortunate. The Commission is responsive to our needs but we must first establish the facts and then present these facts to the Commission.

But what are we talking about in the way of magnitude of the task?

We are dealing in terms of a natural resource which is available for many uses. Other users all have their organizations to protect their interests: National Assoiation of Broadcasters, NAB; American Petroleum Institute, API; Association of American Railroads, AAR; National Committee for Utilities Radio, NCUR; Aeronautical Flight Test Council, AFTC. Add SIRSA, FIR, NAM, Truckers, Taxicabs, numerous others and the picture begins to form.

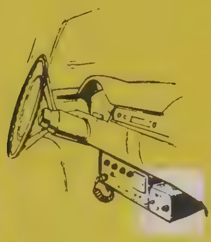
Public Safety has its APCO, ESPRL, AASHO. FCCA and IMSA. But there is a difference.

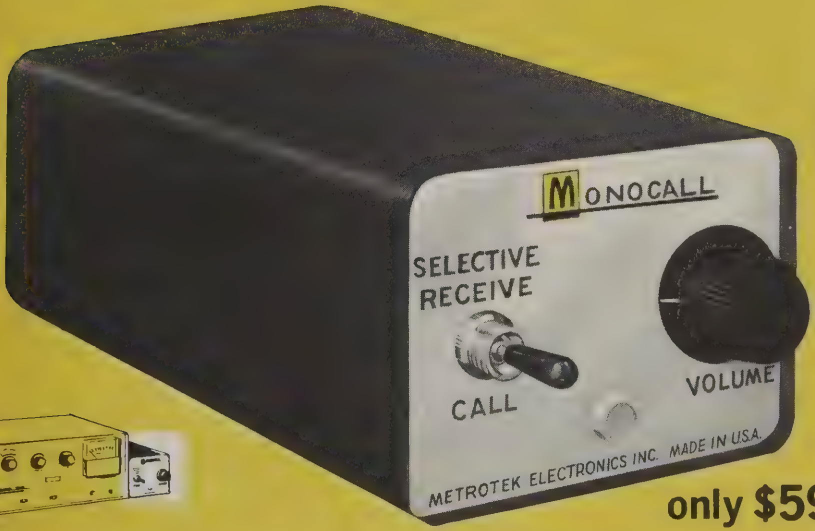
All of the organizations mentioned first are supported by fees charged to the licensees that are members.

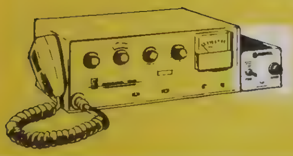
With the exception of FCCA all Public Safety groups are financed largely by those who are employed by governmental entities; cities, counties and states. Only in the last several years has APCO instituted the Governmental Membership or Representation, in which the governmental entity pays a fee based on population and names representatives from its various radio services in Part 10. This is proper. It is not the individual communications administrator, technician or operator who is being served; it is the licensee; the city of ____, the county of ______, the state of ______.

It has long been assumed by many that the Federal Communications Commission would look after the problems of the Public Safety Radio Services simply because of their essential nature. Perhaps this is a natural outgrowth of the fact that originally the use of two way radio was restricted to those services having a safety of life function.

SILENCE PLEASE!







only $59.95

MONOCALL Gives Privacy to Your Two-Way Radio

Introducing the Monocall, a selective call device for use with Citizens Band and Communication systems. No more gobble-de-gook. No need for continuous monitoring. Your set and those in your system are "silent" until you call them or they call you. Easy, single switch operation. Exclusive multiple tone burst and unique circuitry prevent false triggering. Available in 72 codes and can be field modified by changing just two wires to give any one of six code combinations.

- **Single switch,** easy operation. Three positions: Selective Receive, Normal, and Call.
- **Multiple tone burst.** Most selective call devices use a single tone burst. With a single tone system the decoder is subject to false triggering because of squeals and voices. Monocall's multiple tone burst and computer circuitry all but eliminate this undesirable property.
- **Inexpensive.** Monocall Encoder - Decoder, $59.95. Monocall Encoder, $29.95.
- **The advance design** of the Monocall provides a reliability superior to devices using conventional tube or transistor circuitry.
- **Easy to install.** Only minutes required to attach Monocall to your existing Citizen Band or Communication unit. Also, a number of Citizen Band sets are already wired for immediate Monocall "plug-in" use. They include the Starcaster Citizens Band Units Mark I, Mark II, and Mark III; the Realistic TRC-8 Citizen Band Unit; and Metrotek Citizen Band Transceivers.

Metrotek Deluxe
Citizen Band Transceiver $149.95

Eight crystal control channels on both transmitter and receiver. Fully tunable double conversion receiver provides reception on all CB channels. Complete with S-meter, dual power supply for either 12 volt d.c. or 110 volt a.c. operation. Includes "plug-in" for Monocall.

METROTEK ELECTRONICS, INC.

Metrotek

P. O. Box 9591 • Raleigh, North Carolina
Please send me complete details, including name of nearest supplier, for the:

☐ **Monocall Selective Call Device**
☐ **Metrotek C.B. 2-Way Radio**

Name ______________________

Address ______________________

City ____________ Zone _____ State _____

Dealers reply to Dept. M. Some Franchises open.

It started with Police; to which was added Fire, Forestry Conservation, Special Emergency and Highway Maintenance. Power Radio Service was at one time considered an emergency service and may be again, but the big change came under Docket 6651 which made two way radio available to all.

This is the "American Way of Life" and all these various business enterprises who find two way radio a useful tool which will save them money are using it and will continue to use it more and more. The use of the radio spectrum is a dynamic, growing thing but unfortunately the spectrum is finite and it is also not elastic. The portion of the spectrum best suited to use for two way radio communication is but a portion of the total spectrum and it must be shared with other users including our National Defense.

Whenever the demand exceeds the supply, either somebody does without, or else rationing becomes the only alternative. It may well be that the time is fast approaching when a system of priorities will be required to solve this dilemma. If such a system does become a necessity, then the survey proposed by Mr. Kittner could well make the difference as to whether the Public Safety Radio Services have adequate spectrum space available.

As Mr. Kittner mentionad, these other users are not making frivolous requests. Their arguments before the Commission are most genuine and proper. They do contain merit.

However, the dilemma still remains. Where do we find the additional spectrum space required by the various land mobile services, including Public Safety? Among the papers presented to the APCO Conference was one given by Dick Gifford of General Electric, titled: *"RADIO SPECTRUM MANAGEMENT—A CHALLENGE FOR THE NEXT 50 YEARS."* Mr. Gifford is a member of JTAC and is thoroughly familiar with the problems of Radio Spectrum Management. Incidently, that is also the title of a book published by JTAC which is well worth the reading by all who are concerned with frequency problems.

In his paper, Mr. Gifford pointed to certain well established and documented facts. First, the division of spectrum management between FCC and IRAC has not resulted in logical management of the Radio Spectrum.

Second, the phrase: "Public interest, convenience and necessity"; could stand some changes; *i.e.* the use of the radio spectrum can be defined as for: National Security, Internal Security, Goods and Services, Entertainment, Public Information, Private Information and Experimentation, each with its own needs and order of importance. Certainly National Security and Internal Security must come first. Without them the other items become unimportant.

Third, all of the radio spectrum will not serve all purposes equally well. For example, the portion between 25 Mc and 450 Mc is the logical area for the land-mobile services. The area above 1000 Mc is suited only to point-to-point service and certain other fields such as radio positioning. Finally, there is the area from 450 Mc which would be termed the logical area for ""quasi-mobile" services; *i.e.* TV broadcasting where the receiver locations may be at any point although not in motion.

When approached from this most logical viewpoint, the frequency shortage problem disappears. Unfortunately, it is the engineer's approach, and is not yet the law of the land.

LOGBOOK

Submit items for this column to CH Washington Bureau Chief, ROBERT E. TALL at 1327 F STREET N.W., WASHINGTON 5, D.C.

A CALENDER OF IMPORTANT MEETINGS AND EVENTS OF INTEREST TO MOBILE COMMUNICATIONS.

Sept. 17-19—Annual convention of National Mobile Radio System. Statler Hilton. Washington, D. C.

Sept. 23-26—Annual conference of International Municipal Signal Association. Queen Elizabeth Hotel. Montreal.

Oct. 1—FCC oral argument on request of State of Colorado for waiver of police rules to permit police radio system to continue to transmit non-police public safety messages. To be held in Denver.

Oct. 23-25—Annual meeting of Communications & Signal Section of Association of American Railroads. Sheraton-Chicago Hotel, Chicago, Ill.

Nov. 5-6—Annual meeting of Executive Committee of Forest Industries Radio Communications. Dallas, Tex.

Dec. 6-7—13th National Conference of Institute of Radio Engineers' Professional Group on Vehicular Communications. Anaheim, Calif.

Jan. 1, 1963—Ten percent excise tax on private line communication services to "trades" or "businesses" is dropped.

Jan. 1, 1963—Date when new revised FCC Form 505 must be used for Class B, C, or D Citizens radio applications.

NOW! *Profits for you bringing better TV to problem areas.*

Distributors, Servicemen . . . investigate the profits in selling, installing, servicing, the EMCEE VHF Translator in areas that lack good direct TV reception.

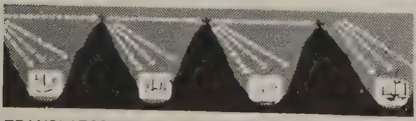
You also profit from increased TV set sales, service customers and sales of replacement parts.

CONVERSION FLEXIBILITY . . . any input channel to any non-adjacent output channel.

FREEDOM FROM INTERFERENCE . . . no internal signals which coincide with input to any other translators.

EASY OPERATION UNDER FCC RULES . . . simple control and identification unit minimizes maintenance and reduces cost . . . no operator required.

EASY-INSTALLATION . . . available for cabinet/rack mounting or in weatherproof housing.



TRANSLATORS MAY BE RUN IN TANDEM TOO!

ELECTRONICS, MISSILES & COMMUNICATIONS, INC.
262 E. Third Street, Mount Vernon, New York

Gentlemen:

C

___Please rush free planning package including data sheet, complete installation check list, coverage calculation form.

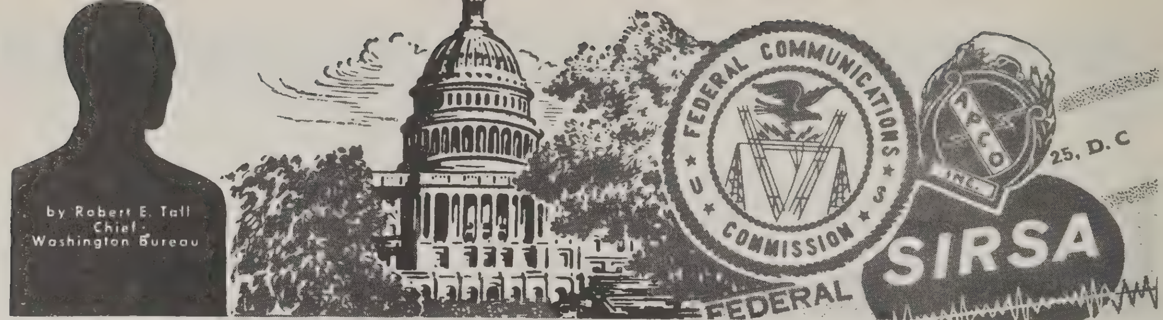
___Please send free reprint of FCC rules covering translators.

NAME________________________________

ADDRESS________________________________

CITY________________STATE________________

ELECTRONICS, MISSILES AND COMMUNICATIONS, INC.
262 EAST THIRD STREET • MOUNT VERNON • NEW YORK



by Robert E. Tall
Chief
Washington Bureau

25-42 Mc COMMENTS POUR IN AT DEADLINE

Comments on the proposed allocation actions in the 25-42 Mc region—the subject of hot argument for months—poured in on the FCC on the August 1 final day.

Included in the comments was a request from the City of Cleveland, Ohio, to "stay all further proceedings" in the docket and to grant an opportunity for oral argument on it.

Two of the three major safety communications organizations strongly opposed frequency rearrangements affecting police, fire and forestry licensees, and the proposed assignment of split-derived channels for use by other services.

SIRSA commended the FCC for the proposal, and concentrated the bulk of its attention on the congested frequency conditions of the service.

The land mobile communication section of the EIA commented strictly on technical portions of the proposal, staying completely clear of the question "who gets what?"

Possibly the most unexpected comment came from United Press International. The national news service had been asking for some time for a nationwide channel for its newsgathering operationss, and under the proposal would win spots at 37.44 and 37.88 Mc. UPI, however, said it would prefer high-band frequencies and suggested that the low-band frequencies be assigned to "some other service."

RCC CALLED TELEPHONE COMPANY

A Florida radio common carrier has been termed "a telephone company as defined in . . . the Florida statutes" by its opponent in an FCC action.

Southeastern Telephone Co. told the Commission that Radio Telephone Communications, Inc., "must" obtain a certificate of public convenience and necessity from the Florida railroad and utilities commission, as a result of the RCC's joint ownership of toll circuits between Tallahassee and Quincy.

Southeastern has filed a petition to deny RTC's applications for a new two-way radio service at Qunicy and additional facilities at Tallahassee. The RCC offers a recorder-relay service, which the telephone firm claims is an illegal interconnection.

COMMISSIONER TO SPEAK AT NMRS

FCC Commissioner Robert E. Lee will be the featured speaker at the September 19 banquet during the NMRS convention in Washington.

Rep. Emanuel Celler, of New York, will be featured at a luncheon the previous day during the three-day convention.

INTERCONNECTION REVISIONS OFFERED

The National Mobile Radio System has offered to its membership proposals for revision of the standard interconnection agreement between RCC's and Bell System companies.

The revised agreement offers a 10-cent per call or $2 per unit per month flat rate charge to RCC subscribers, and looks toward the telephone firm providing connecting circuits and related telephone equipment free of charge. It does not contemplate a charge to telephone company subscribers for calls placed to RCC users.

The new agreement limits the number of connecting circuits to be provided to one per channel.

Several provisions of an earlier revision which drew opposition from a number of NMRS members have been removed from the new agreement, the group said.

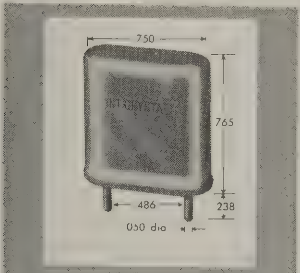
EMERGENCY RADIO CALL BOX SYSTEM OKed

A radio-operated emergency call box system, called the "world's first" by its manufacturer, has won Commission approval for use on Los Angeles freeways.

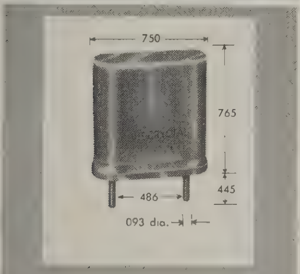
The system, operating on 72.50 Mc in the local government radio service, will include 80 sun-powered units. A unit will be spotted every quarter-mile along the four major freeway routes through the California metropolis.

In operation, a motorist in need of help can push a front-panel button (the only operating con-

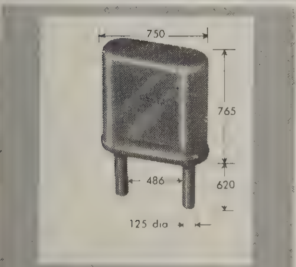
Custom made CRYSTALS



F-605



F-609



F-612

FREQUENCIES 70 KC TO 137 MC

DESCRIPTION AND DATA:

All of these crystals are of the plated, wire-mounted type. Low drift AT-cut blanks are used in these units above 500 KC, and low drift DT and CT-cut blanks are used in units below 500 KC; any crystal can be supplied for operation with or without an oven.

TEMPERATURE TOLERANCE:
AT—±.005% from —55° to +90°C.
±.002% from —30° to +60°C.
DT-CT—±.01% from —40° to +70°C.

CALIBRATION TOLERANCE:
Supplied to meet equipment manufacturers speifications and may be as close as .001% without oven or .0005% with oven. Where no equipment is specified the following will apply.
AT— .0025% of nominal at +30°C.
DT-CT— .01% of nominal at +30°C.

DRIVE LEVELS:
Maximum, AT—
10 milliwatts 500 KC to 999 KC
4 milliwatts 10,000 KC to 24,000 KC
2 milliwatts 25 MC to 137 MC
DT-CT—2 milliwatts

CIRCUIT: As specified by customer. Crystals are available for all major two-way equipment and in most cases the necessary correlation data is on file. Where circuit is not specified, the crystal will be calibrated for operation into a load capacitance of 32 mmf.

FREQUENCY RANGES AND MODES OF OPERATION

200-500 KC:
Operates on fundamental edge shear oscillation. Load capacitance 32 mmf . . . or as specified by customer. If load is not known specify circuit or equipment in which crystal will be used.

500-20,000 KC:
Operates on fundamental face shear oscillation. Load capacitance 32 mmf . . . or as specified by customer.

10-60 MC:
Operates on third mechanical overtone at anti-resonance. Will give reasonable output in tuned circuit.

60-100 MC:
Operates on fifth (or seventh) mechanical overtone at series-resonance. Drive level must be kept below 2 milliwatts.

ONE DAY SERVICE

Orders for less than five crystals are shipped within one working day following receipt of order (except low frequency and special crystals which require 10 to 30 days for processing). Orders received on Mon. thru Thurs. will be shipped the day following. Orders received on Fri. will be shipped the following Mon. Postage is prepaid within continental U.S. when cash accompanies order. All others are shipped F.O.B. Oklahoma City.

SUPPLY THIS INFORMATION WHEN ORDERING

MOTOROLA: Crystals can only be properly correlated for Motorola equipment if the crystal type number is given. Example: D02, R28, D03, etc. In cases where crystals are required for type D-14, 800 and 801 holders, always specify crystal frequency or the high IF frequency. Check whether the crystals are to be used in ovens.

GENERAL ELECTRIC: Specify model number of transmitter and receiver RF Decks. Example: 4ES13A3, 4ER24B1, 4ET5B3, etc. When ordering crystals for 450 MC equipment specify:

Receiver Crystals:
A. If they are heate
B. If the unit is AFC
Controlled.
C. Platter number of
deck.

Transmitter Crystals:
A. If they are heated or non-heated.

R.C.A.: Specify model number of unit or MI Number of the crystal. Always indicate whether crystals are to be non-heated or heated type.

OTHERS: Specify model number of the receiver and transmitter as well as any formulae that pertain to the correct crystal calculation.

PRICES — F-605, F-609, F-612 CRYSTALS

Fundamental KC		**Fundamental KC**		**Overtone MC**	
200 - 499*	**$12.50**	3000 - 3999	**$5.75**	10 - 34.99	**$ 6.50**
500 - 849*	**15.00**	4000 - 5999	**5.00**	35 - 44.99	**7.00**
850 - 899*	**13.50**	6000 - 9499	**4.50**	45 - 60	**8.50**
900 - 999*	**12.50**	9500 - 10999	**5.00**	61 - 75	**10.50**
1000 - 1499†	**9.80**	11000 - 14999	**6.30**	76 - 137	**15.00**
1500 - 1999†	**7.50**	15000 - 20000	**8.00**		
2000 - 2999	**6.50**				

*Allow 10 to 30 days for processing. †Allow 2 to 3 days for processing.

FREE 1962 CATALOG

Send for yours today!

International Crystal Mfg. Co., Inc.
18 North Lee, Oklahoma City Okla.

Rush FREE 1962 Catalog CH

Name____________________
Please print

Address____________________

City__________Zone______State______

INTERNATIONAL CRYSTAL MFG. CO. INC.

18 NORTH LEE • OKLAHOMA CITY, OKLA.

trol on the outside of the unit) and thus signal police headquarters.

At the dispatcher's position, the signal is identified as to location and a patrol unit dispatched. When the officer arrives at the scene, he can unlock the box and send back one of 14 pre-coded messages for additional help if necessary.

MICROWAVE RELOCATION PROPOSED

The FCC has proposed rule changes to reallocate the 6425-6575, 10550-10680, and 11700-12200 Mc bands "so that specified portions thereof will be allocated exclusively for common carrier mobile uses and the remaining bands will be allocated exclusively for private mobile uses."

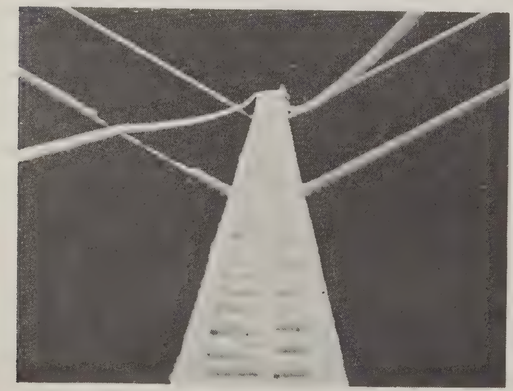
The lower and higher bands are already microwave mobile bands: the proposed change would eliminate fixed operations in the 10550-10680 Mc region. Comments on the proposals are due October 1.

NMRS HAM NETWORK RESUMES

The amateur radio network composed of hams who are also NMRS members fired up again on August 1. Organizer Ralph Hicks, Tulsa, Okla., said net meeting time is each Wednesday evening at 9 p.m. EDT. The net meets on 7100 Kc (CW).

ROHN TOWERS STAND THE TEST!

Heavy ice loading, coupled with high winds, is the severest of all tests for a tower. It PROVES sturdiness and sound engineering. Below is a ROHN Communication Tower that clearly withstood such a test.



For Towers That Can Stand Rigorous Abuse, Call or Write. Complete engineering and erection service available.

ROHN *Manufacturing Co.*

P. O. Box 2000
Peoria, Illinois

"Pioneer Manufacturer of Towers of All Kinds"
REPRESENTATIVES WORLD-WIDE

MOBILE RELAY RULE CLARIFIED

The FCC has amended its rules dealing with special emergency radio service mobile relay stations to make clear that such stations are limited to operation of frequencies higher than 952 megacycles.

The action brings the special emergency rules in line with past rule-making which deleted 450-megacycle frequencies from that service.

RCC LICENSE REVOCATON ASKED

One California radio common carrier has asked the FCC to revoke the license of another in the continuing competitive dispute between Kay Kelso Kidd and Thomas R. Poor.

Kidd charged that Poor committed "a willfull violation of the terms of (his) license and the Commission's regulations" by purchasing and operating a telephone answering service to accept calls for his subscribers.

Poor's firm, Kern Radio Dispatch, is licensed to operate at a location south of Taft, Calif., with a control point in Taft. Kidd's company, Radio Dispatch Engineering Co., operates in Bakersfield.

Kidd charged that the use of the telephone answering service in Bakersfield to accept calls for Poor's subscribers "constitutes, under the rules of the FCC, the establishment of a control point" and said that such establishment without prior authorization was a "willfull violation" since the point was covered in a prior hearing involving an application by Poor. Kidd asked that a "show cause" order be issued against Poor.

IRE-AIEE MERGER APPROVED 7 TO 1

Members of the Institute of Radio Engineers have approved by a 7-1 margin the proposal to merge with the American Institute of Electrical Engineers, effective January 1, 1963.

CLASSIFIED

Classified advertising rate is 25 cents per word. We do not bill for advertising in CLASSIFIED, nor can we acknowledge receipt of copy sent in. Full remittance must accompany all orders; closing date for each issue is the 5th of the preceding month, in Oklahoma City.

INSTANT CASH for all makes and models of used Two-Way Radio Equipment. We have available for immediate delivery most makes and models of Two-Way Radio Equipment. Guaranteed to please. COMMUNICATIONS SERVICE, INC., 3209 Canton Street, Dallas, Texas.

CH SHOWCASE

NEW HI-BAND UNITS OFFERED

Another name has been added to the list of firms manufacturing two-way radio equipment with the announcement that *DARE, Inc.* (Troy, Ohio) is offering a full line of units for the 148-175 Mc range.

Available in either 40 or 75 watt output, the firm's "Darector" line offers the unique option of two-channel operation with up to 24 megacycles separation between the channels.

The Ohio firm, an established manufacturer of precision aircraft and navigation equipment for commercial, military, and personal aircraft, said pricing structure of the new line will be in the "under $500" range. For full specs and data, write D. K. Johnson, Sales Manager, at Box 312, Route 61, Troy, Ohio, and tell him where you saw this.

DEVIATION METER FOR NARROW-BAND, TONE SQUELCH

Motorola has just announced that their recently developed deviation meter has been incorporated into the S-1059A portable test set.

The new meter, which covers all two-way radio frequencies from 20 to 500 Mc, has 5-percent accuracy in three ranges: 1.6 Kc, 8 Kc, and 16 Kc. It is transistorized for reliability and compactness.

The deviation meter is also available in conversion kit form for Motorola's earlier model TU-546 test set. For complete information, write Bill Mahoney, Motorola Technical Information Center, 4501 West Augusta Blvd., Chicago 51, Illinois.

BROADBAND BASE STATION ANTENNAS

A line of four broadband base station antennas, offering gain up to 9 db in the range from 148 to 174 Mc, has been announced by *Communication Products Company,* Division of Phelps Dodge Electronics Products Corporation, Marlboro, N. J.

Each of the four new antennas consists of an array of four radiating elements mounted on a 2⅜-inch O. D. aluminum support pipe fed by a sealed binary phasing and matching harness (factory-installed inside the pipe).

Since all matching is inside the support pipe, the new line is said to be the cleanest aerodynamic structure possible for its type.

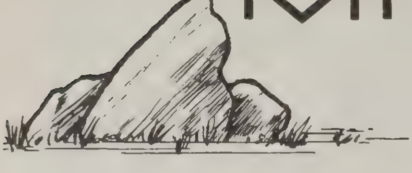
Model numbers of the four antennas making up the line are 340-509 (148-162 Mc, 6 db gain); 341-509 (160-174 Mc, 6 db gain); 342-509 (148-162 Mc, 9 db gain); and 343-509 (160-174 Mc, 9 db gain). For complete specifications, write the manufacturer and tell him you saw it in CH Showcase.

LOW COST MONITOR RECEIVER

Two new low-cost monitor receivers for low and high band use have been announced by *Hammarlund Manufacturing Company,* 53 West 23rd Street, New York 10, N. Y.

The Model MR 61X covers the 25-54 Mc band, while the model MR 51X covers 147 to 174 Mc. Both units are crystal-fixed to any one predetermined channel within their ranges. An optional channel selector kit may be added to allow up to 6 channels, all crystal-controlled.

For pricing and complete technical data, write Frank Lester at Hammarlund and tell him we sent you.



MILESTONES

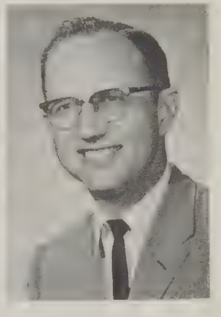
PEOPLE, PLACES, AND THINGS
IN THE NEWS

From New York to California, people made the news again this month.

Gregory G. Gebert, application engineer for *Rotron Manufacturing Company, Inc.*, Woodstock, N. Y., presented one of the major technical papers heard at the 3rd Electronic Circuit Packaging Symposium in Boulder, Colo. His paper was on "Cooling High Density Packages with Air at Any Elevation."

In California, Clifford L. Woolsey of Burbank was appointed as the agency to handle advertising for all divisions of *GC Electronics Company*. GC is a division of Textron Electronics Inc., and encompasses a number of divisions itself.

In between, *Electro - Voice, Inc.* named George R. Riley vice president and general manager of its American Microphone Company division. American Microphone was recently acquired by E-V from GC. Riley was manager of commercial products at Electro-Voice prior to his appointment.



George Riley

James J. "Whitey" Larkins was named manager of customer services for *DARE, Inc.* (Troy, Ohio) FM Division. The well-known aviation electronics firm has recently announced its entry into the FM radio communication field. Larkins was responsible for the design of DARE's new FM line, and will direct the firm's nation-wide system engineering and customer service program.

In Chicago, Allied Radio Corporation elected William A. Harrison as its treasurer. With Allied for one year, Harrison had been assistant treasurer. Before coming to Allied, he was with Philco for 20 years.

And back in New York, John Sheldon was named sales manager for the Hi-Q division of *Aerovox Corporation*. Sheldon had been assistant division sales manager of the capacitor-making firm.

Systems also made news from coast to coast, as *Motorola* announced contracts for four new installations totalling 731 mobile and base units plus four microwave stations.

REPRESENTATIVES WORLD-W

Largest of the systems was the 22-unit, $170,000 installation awarded by the State of Washington. It will replace and expand separate radio systems operated by the Washington Highway Department, Fisheries Department, Game Department, and the University of Washington campus police.

Equipment covered in the contract includes 35 base stations, 249 mobile units, three aircraft radio units and five "Handie-Talkies".

Next largest is the 200-unit system ordered by Commonwealth Edison Company of Illinois. It includes nine 60-watt base stations and 230 mobile units.

The microwave installation is a 79-mile hookup for the Pennsylvania Electric Company, of Johnstown. It will initially provide 14 channels between three terminal stations, with one repeater.

The final system is a 200-unit one for the Oregon State Board of Forestry. Included are four 60-watt base stations, two mobile relay stations, 80 mobile units, 96 "Handie-Talkies", and one aircraft unit. Included on the same order were 12 more mobile units to add to an existing system.

Among other news items this month was one which careful readers of CH learned about last month: The Zeus portable electric power generator, formerly built by Pesco Products Division of Borg-Warner, has been purchased by *Antenna Specialists Company, Inc.*, of Cleveland, Ohio. (It was advertised here last month but the release was not made until this month.)

The Zeus line will continue its identity as a separate division of Antenna Specialists, said Milt Friedberg, A/SP president.

And in Owensboro, Kentucky, the people at *General Electric's* Receiving Tube Department have put together an 8-page booklet showing the value-analysis outline of the benefits of ceramic planar receiving tubes. Ask for booklet ETD-2298 if you're interested.

on other horizons this month:

You know, there's just a chance you might *not* know that we here at Horizons publish a number of other electronics specialty magazines. Just as COMMUNICATION HORIZONS covers the entire field of non-broadcast communuications (including microwave, now), our other magazines provide complete coverage of the fast-growing CB radio industry, the highly-specialized Community Antenna TV area, and the history-making VHF/UHF ham radio field. Here's what's appearing in the current issue of each of our other magazines on other horizons:

CB HORIZONS

The 60 packed pages of CB Horizons' September issue contain a number of technical and construction articles. Leading off is the first installment of a series on audio compression, explaining just what this potent signal-helper is and how it fully illustrated. Informative feature of the month describes the Business Band and what it isn't. Also included are features on conversion of the HE-15, two interesting works. For people who like to build, there's a long how-to-do-it on the CBH VTVM, articles on CB in a canoe and life-saving in Michigan, a set of troubleshooting charts, and all the regular features.

tv

Television Horizons, in September, takes a deep look at the Amperex 7788 described in these pages last month, with a cover feature on this tube's use in broadband amplifier service. Additional features cover the bringing to reality of 12-channel TV systems, "High-band plus low-band equals all-band", and proposal for pay TV in Great Britain. Regular features include general industry news; reports of new equipment, acquisitions, and trends; and late word from our European correspondent. Incidentally, this magazine is now edited by Russ Miller (associate editor here), and this is his first issue—it's taking on a more-detailed look than before.

VHF HORIZONS

September is for Sideband in VHF Horizons; the 40 pages of issue No. 3 are bursting at the seams with VHF sideband information. Construction articles include *complete* how-to-do-it's on a filter-type exciter for 6 meters, a phasing rig for two, a double-sideband 50-Mc unit for the quick and easy way to VHF sideband, and a "transceiverter" to adapt popular low-frequency transceivers to 6-meter sideband use. Non-sideband feaures include a staff report on crystal oscillator stability and how to improve it; part two of last month's "staff extra" on ower erection; and all the usual news and departments.

It's been our experience that many readers of one of our magazines also have special interests in a field covered by another Horizons publication — yet don't know that the other magazines exist. If you would like a sample copy of the latest issue of any of these publications, together with either subscription or advertising data, just drop a postcard to our Promotion Department, Horizons Publications, P. O. Box 1557, Oklahoma City 1, Okla. Do it today!

HORIZONS HP PUBLICATIONS

the first family of electronics specialty magazines

Prodelin . . . Single Source Responsibility for

SEMI-FLEXIBLE COAXIAL CABLES AND MATCHING CONNECTORS

Low-loss, broadband performance, simple field assembly and reliable trouble-free service are proven features of all Prodelin coaxial cables and companion connectors. Truly matched performance is guaranteed by Prodelin, a single-source responsibility for the design and manufacture of "job-packaged" antenna and transmission line systems for over 16 years.

Spir-O-line. Semi-flexible, Aluminum Sheathed Coaxial Cables for Broadband Services up to 16 Kmc.

Spir-O-foam. Semi-flexible, Aluminum Sheathed, Polyethylene-foam Insulated Coaxial Cables for Broadband Services up to UHF Frequencies.

Spir-O-lok. Solderless Coaxial Connectors for Simple, Fast and Reliable Installations without Special Tools.

SPIR-O-LOK
U.S. PAT. 3,010,747

SPIR-O-LINE
U.S. PAT. 2,998,472

Write Dept. M for Catalogs

- **591**—Spir-O-line and Spir-O-foam Semi-Flexible Coaxial Cables, and Spir-O-lok Connectors
- **595**—Rigid '800' Coaxial Transmission Line
- **598**— 2-Way Mobile Antennas
- **603**—Microwave Parabolic Antennas and Accessories

"THE WORLD'S FINEST"
Prodelin®
ANTENNA AND TRANSMISSION LINE SYSTEMS

PRODELIN, INC., Hightstown, N.J. • 448-2800 Area Code 609
CALIFORNIA ENGINEERING OFFICES & WAREHOUSE STOCK:
6400 Corvette St., Los Angeles 22 • OV 5-7540 ▪ 870 Tennessee St., San Francisco 7 • AT 2-8472